Educational Design Principles of Using AI Chatbot That Supports Self-Regulated Learning in Education: Goal Setting, Feedback, and Personalization

Abstract

The invention of ChatGPT and generative AI technologies presents educators with significant challenges, as concerns arise regarding students potentially exploiting these tools unethically, misrepresenting their work, or gaining academic merits without active participation in the learning process. To effectively navigate this shift, it is crucial to embrace AI as a contemporary educational trend and establish pedagogical principles for properly utilizing emerging technologies like ChatGPT to promote self-regulation. Rather than suppressing AI-driven tools, educators should foster collaborations among stakeholders, including educators, instructional designers, AI researchers, and developers. This paper proposes three key pedagogical principles for integrating AI chatbots in classrooms, informed by Zimmerman's Self-Regulated Learning (SRL) framework and Judgment of Learning (JOL). We argue that the current conceptualization of AI chatbots in education is inadequate, so we advocate for the incorporation of goal setting (prompting), self-assessment and feedback, and personalization as three essential educational principles. First, we propose that teaching prompting is important for developing students' SRL. Second, configuring reverse prompting in the AI chatbot's capability will help to guide students' SRL and monitoring for understanding. Third, developing a data-driven mechanism that enables an AI chatbot to provide learning analytics helps learners to reflect on learning and develop SRL strategies. By bringing in Zimmerman's SRL framework with JOL, we aim to provide educators with guidelines for implementing AI in teaching and learning contexts, with a focus on promoting students' self-regulation in higher education through AI-assisted pedagogy and instructional design.